



Trumpeter Swans Lead Poisoning Mortality Investigation Progress Report 2004

Background

At least 1,400 Trumpeter Swans (*Cygnus buccinator*) and Tundra Swans (*C. columbianus*) died in Whatcom County, Washington State and the Sumas Prairie, British Columbia during the five winters of 1999-2004, the majority from ingestion of lead shot while feeding. The annual numbers of mortalities vary from approximately 100 to 400 individuals. There was also a die-off involving lead shot and approximately 100 swans in the same area in 1992.

The use of lead shot for waterfowl hunting was banned in Whatcom County, United States in 1989 and in the Sumas Prairie, British Columbia in 1990. Lead shot continues to be permitted on some upland hunting & trap shooting areas. In 2001, Environment Canada (Canadian Wildlife Service), the Washington Department of Fish and Wildlife and the US Fish and Wildlife Service jointly initiated a study to locate the sources of lead and halt the swan mortalities. Results are presented for field work conducted over the past three winters (2001-04). The study is continuing through the winter of 2005.

Investigation of swan activities

Over the past three winters, a total of 184 trumpeter and tundra swans were trapped and blood samples collected for lead residue analysis. Of these, 147 trumpeter swans were also outfitted with VHF radio transmitters. The locations of radio-tagged swans were recorded each day and night to locate forage areas and roost sites. Swan roadside surveys were conducted in Whatcom County and Sumas Prairie twice per week from October through December. Sick and dead swans were collected throughout the winters. Carcasses have been examined to determine cause of death and gizzard contents identified.

Twenty-seven of the 147 radio-tagged trumpeter swans died. Seven of the 27 swans are confirmed as lead poisoned, 8 were scavenged (only collars located and cause of death could not be ascertained), 2 are undetermined (lead residues pending), 2 were not lead poisoned and 8 had elevated lead burdens at time of capture.

Analysis of blood samples suggest that 76% of the swans arrive on the wintering grounds with low lead levels reflective of natural background exposure. The remainder had levels above the threshold for sub-lethal exposure. Swans trapped between Dec 15th-31st had the highest average blood lead levels, significantly higher than those swans trapped between Nov 15th – Dec 14th. The majority of the swans trapped between Dec 15th-31st were captured in an area of interest near the US/Canada border.

Over the past 4 years, approximately 1,000 swan carcasses have been collected. Assessment of these data is ongoing.

Habitat use patterns of the lead poisoned and apparently healthy individuals were compared and two areas of interest have been identified - an area near the US/Canada border and an area in eastern Whatcom County.

Surveys for lead shot

Some areas of high swan use were assessed for lead shot by collecting core samples at 14 forage fields, 8 roost sites, and 6 temporary roost sites. All forage fields were located in the Sumas Prairie. Based on an assessment of hunting activity, a sampling location was selected and core sampling was conducted. Of the 8 roost sites assessed, 4 were in the Sumas Prairie and 4 in Whatcom County. At the Sumas Prairie roosts, core sampling was conducted over the entire roost site. In Whatcom County core sampling was restricted to the perimeter of the roost.

Lead shot was retrieved from cores in 5 of the 14 forage fields, 5 of 8 permanent roosts, and all 6 temporary roosts examined. Lead shot density estimates were highest in the forage fields, followed by permanent roosts and then temporary roosts. Shot was recovered from throughout the core column.

Permanent roosts are unlikely major sources of lead shot because (a) all roosts were used by swans prior to 1999 when annual mortalities commenced, (b) no roost was used by all lead poisoned collared swans, (c) all roosts were frequently used by apparently healthy collared swans, (d) scientific literature suggests that in agricultural areas swans prefer to forage in fields versus roost areas, (e) lead shot densities appear low and it is unlikely that swans are able to extract high numbers of shot. Temporary roosts contained low densities of lead shot and are not suspected as major sources.

Conclusions

Several "areas of interest" have been identified as potential sources of lead shot responsible for the swan mortalities. The work group will continue to use the most scientifically effective methods to accurately determine the primary source(s) of the lead shot.

Future activities

Activities to be undertaken in the 2004-05 winter include trapping, blood sampling, tagging and monitoring up to 100 additional trumpeter swans. Approximately 78 previously collared swans may return this winter; these individuals will also be monitored. Daily telemetry efforts will be focused on the areas of interest. A more encompassing survey will be conducted once a week, preferably from aircraft. Swan population roadside surveys will be conducted twice per week from October through January. Sick and dead swans will be collected, examined for cause of death and gizzard contents identified. The goals for 2004-05 are to better identify the potential source areas and based on results, initiate actions to neutralize the sources of lead shot and stop the swan mortality.